

Effects of La Nina on Hantavirus Pulmonary Syndrome in the U.S. Southwest

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Satellite imagery was used to characterize the environmental effects of El Nino and La Nina events in the U.S. Southwest in the early-late 1990's. It has been hypothesized by other workers that El Nino events generate unseasonal precipitation in the spring-early summer that are associated with increased vegetation growth. This growth, in turn, produces food and cover for the rodents that transmit the virus responsible for Hantavirus Pulmonary Syndrome (HPS). La Nina events are thought to result in decreased precipitation that reduces HPS risk. To evaluate this hypothesis we used information on the number and location of HPS cases over time to identify environmental conditions associated with human disease risk. We found that: Satellite imagery does identify environmental conditions associated with HPS risk for people; HPS risk increases with the onset of El Nino events and decreases during La Nina events, and; Areas identified as high risk for humans show increased levels of rodents that carry the hantavirus causing HPS during the second year of an El Nino while the rodent populations decline during La Nina. These results support the hypothesis that ENSO events trigger a 'trophic cascade' of ecosystem events that cause variation in human disease risk.

